Paper No. 23

TITLE: PREPARATION OF OPTICALLY PURE R-(+)-NICOTINE. STUDIES ON THE MICROBIAL DEGRADATION OF NICOTINOIDS

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ABSTRACT: Studies on the physiological and insecticidal properties of the optical enantiomers of the alkaloids of Nicotiana tabacum L. were undertaken to better understand the actions of the naturally occurring alkaloids. These investigations were limited to R-(+)-nicotine (1) and R-(+)-nornicotine due to the difficulty in obtaining enantiomers of the Nicotiana alkaloids. Furthermore, these investigations, in general, suffered from the lack of a convenient, reliable method for the preparation of optically pure materials. Good yields of 1 of high optical purity (average 99.6%) have been obtained fom R,S-nicotine by stereoselective microbial degradation of the S-(-)-nicotine using the microorganism Pseudomonas putida. Based on the starting concentration of 1 in R,S-nicotine, about 65% of 1 was isolated after five days of incubation with P. putida under aerobic, liquid culture conditions. Additional results from liquid culture experiments where the incubation times were greater than five days suggested that P. putida could degrade 1. This was in contrast to the agar plate studies which revealed that the microorganism could not metabolize (as measured by growth on agar) 1 or other nicotine related alkaloids.

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